MASSACHUSETTS INSTITUTE of TECHNOLOGY

D28
M414

WORKING PAPER
ALFRED P. SLOAN SCHOOL OF MANAGEMENT

STEEL AND THE EUROPEAN ECONOMIC COMMUNITY

Bruce Kogut

WP 1119-80 November 1980

MASSACHUSETTS
INSTITUTE OF TECHNOLOGY
50 MEMORIAL DRIVE
CAMBRIDGE, MASSACHUSETTS 02139

STEEL AND THE EUROPEAN ECONOMIC COMMUNITY

Bruce Kogut

WP 1119-80 November 1980

I would like to thank Professors Stephen Kobrin, Donald Lessard, and Richard Schmalensee for their comments. Special gratitude is due to Professor Richard Robinson for his careful reading of the text.

Dewey

MASS. INST. TECH.
NOV 18 1983
LIBRARIES

The founding of the European Coal and Steel Community in 1952 had raised the hopes of the establishment of an industry based upon a continental scale and range of investment and production uninhibited by national borders. Almost thirty years later, the European steel industry is characterized by a prolonged stagnation of demand and excess capacity, resulting in large part from the failure to develope a set of institutions that would permit an efficient allocation of investments and productive resources within a transnational market. Despite its significance as the original focus of postwar attempts to promote European integration, the industry has been marked by the play of strong national interests, especially in the area of subsidization and regional development policy, and by the apparent use of oligopolistic market agreements. The force of the current crisis has, however, resulted in the creation by the Commission of the European Economic Community (EEC) of a community-wide agreement on rationalization schedules, as well as in the imposition of fines on leading firms for illegal collusion. It is, indeed, a bold move on the part of the Commission to attempt to administer an industry as highly politicized as it is financially troubled.

In light of this conflict between national policies and the goals of a transnational community, the purpose of this paper is to investigate the industrial behavior and integration of the European steel industry. While most often seen in terms of the expansion of production and market opportunities, the interrelationship of industrial behavior and economic integration has also significant ramifications on the structure and performance of the industry. (1) Specifically, the four following propositions are addressed:

71448

1) The national steel industries have responded to the openning of borders in two primary ways: (1) government requests for intervention in respect to investment, production and price decisions, or (2) oligopolistic collusion.

2) The lack of a supranational regulatory body endowed with sufficient independent powers permitted the persistence of national governmental interference.

3) The absence of nigh market interpenetration, national product specialization, and transnational joint ventures and mergers reflects invisible national boundaries in respect to the allocation of economic resources.

4) The mixed public and private enterprise nature of European steel has led to investment distortions in both location and choice of technology.

Since the four propositions are complex and interrelated, the format of this paper does not discuss each individually. Rather, the paper considers in turn the three primary sets of actors: the firm, the national government, and the Commission. The first part consists of a historical and institutional description of the European Coal and Steel Community (ECSC) and the EEC. The next section discusses the two primary responses of the national industries, i.e. cartelization and merger activity. An examination of these two responses sheds light on corporate reactions to the creation of the Common Market. The third section focuses on the role of the national governments in pursuing regional employment policies and the impact of these policies on corporate strategy and investment decisions. Special attention is paid to the growth of mini-mills in northern Italy as a response to the joint presence of public and private enterprises. The fourth section concerns the attempt and success of the Commission in mitigating the anti-competitive behavior and the regional barriers resulting from the actions of both firms and governments. These two goals of competition

and integration have often been, as is noted, not reconciliable. Finally, the concluding section seeks to assess the current status of the steel industry, especially in light of the Davignon Plan, and the integrative implications of the ECSC.

Methodological Note

As this paper is intended to be a contribution to the growing field of political economy, it is important, at the risk of a digression, to define this undeveloped field in terms of its theoretical and methodological structure. Political economy can be defined, for our purposes, as the study of the causes and nature of the covariance between the political and economic equilibria of a given system. In a static framework, economic equilibrium is generally interpreted as the set of prices that clears all markets such that there exists no positive or negative excess demand for goods. In a dynamic framework, it implies an optimal investment policy that equates the marginal return on capital across all markets over time. In the presence of increasing returns to scale, imperfect knowledge, and other entry barriers, this equilibrium is likely to deviate from that predicted by models of perfect competition and to be characterized by the existence of oligopoly or monopoly.

The nature of the political equilibrium is not as amenable to abstraction. Whereas economic studies usually posit profit maximization as the grounding behavioral assumption, political analyses must consider at least two motives: power and wealth. These two motives, especially in Marxist critiques, are often treated as synonymous, but this

assumption appears to eliminate a useful distinction between the two factors. Despite the more complex behavioral considerations of political analyses, there is, nevertheless, a striking isomorphism in neo-classical economic and pluralist political models. (This is not surprising in consideration of the influence of Adam Smith's notion of the market place on the political writings of James Madison and John Adams which form the historical origin of modern pluralism.) Accordingly, pluralist models posit the existence of several differentiated groups that pursue their self-interest. The process of bargaining and negotiation results in an equilibrium which is not dominated by any one group.

Both models are, however, deficient in their treatment of large organizations with market and political power. Analyses conducted strictly according to the prevalent political and economic models are of an essentially partial equilibrium nature, as the interactive effects of political and economic action by large organizations are commonly ignored or uncritically posited. Cartelization, which plays a significant role in the European steel industry, is an interesting case in point. In the absence of an optimal taxation policy, a cartel effects increased profitability at the expense of the consumer, in addition to a deadweight welfare loss caused by a cutback in production. This economic result is, however, not passive in its impact on the political equilibrium. Since these effects are both distributional and allocational, a government is likely to be sensitive to the political implications. Political responses can take the form of anti-trust laws, of state ownership (by which profits are redistributed among political interests), or of state tolerance. As few cartels are perfect in

disciplinary powers and as government responses tend to be negotiated, the ensuant economic and political equilibrium can not be predicted by analytical methods.

The nature of the dynamic equilibrium is, therefore, more analytically complex under conditions of institutional change. The focus of this paper is, though, precisely that of institutional change, namely, the degree to which a transnational community was achieved and the impact of this community upon corporate and government behavior in terms of industrial performance. In the absence of a well-defined theory, the paper seeks to provide, firstly, a narrative description of the institutional and economic developments in the coal and steel community and, secondly, an explanation of these outcomes primarily through the use of models drawn from the literature on the microeconomic behavior of oligopolies. (2) In addition, attention is paid to industrial attributes often overlooked in more formal economic studies, e.g. the role of ownership ties, industry ethos, and government and firm bargaining. (see Joskow, 1974, on the difficulty of incorporating these elements into mainstream oligopoly theory).

In order to simplify our task, three behavioral assumptions underly the analysis. First, national governments are assumed to pursue a complex set of goals which respond to both the needs of business and labor. (Despite the classical formulation of conflict, their interests can often coincide in face of third-party threats.) As a result of this assumption, no attempt is made to explain how and how strongly labor influences government business policy in order to maintain sectoral and regional employment. Rather, we assume that the government responds to

the interest of labor, while considering the interests of other groups and the requirements of other policies. Secondly, firms are assumed to maximize economic goals, e.g. profits or market share. Political power is not considered as a sought end, but as a means to effecting particular business outcomes. Thirdly, the European Commission is assumed to seek a set of transnational goals, although not necessarily those embodied in the spirit of the Treaty of Rome. Whether the Commission pursues exactly a set of transnational goals or the conditions for its survival would be methodologically problematic if not for the saving grace, from the viewpoint of this study, of its relatively narrow room for discretionary behavior.

As the central concept underlying this study is that of economic transnationality, it is worthwhile to consider its measurement. (3) The following analysis considers transnationality according to three economic dimensions: ownership, production, and marketing. By ownership, it is not meant the number of shares held by foreign interests, but more precisely, the degree to which a firm or joint venture is controlled by interests of diverse nationality. Production refers to the degree to which firms locate their manufacturing plants in foreign countries. By marketing, it is meant the extent to which interpenetration of trade occurs across national borders. (Product specialization is also a possible measure of transnationality, but is largely redundant due to its theoretically presumed correlation with interpenetration of trade.) Economic transnationality can not, therefore, be measured by a single indicator. This multi-dimensionality of scaling presents interpretative difficulties, as in the case of the European steel industry where transnationality in ownership is

unimportant but that in marketing is rather significant. Interpretation must follow, consequently, from balanced judgement based upon the relative importance of each factor as well as the absolute measure along each dimension.

Two sets of information will be employed: statistical and circumstantial data. The statistical information is limited in quantity and quality, especially as the most interesting data, e.g. internal costs of plants and utilization rates by plant size, are not easily, if at all, attainable. The use of circumstantial data, including cases and interviews, can be a significant complement to more quantitative studies. Case studies pose, admittedly, the problem of external validity and the level of generalization. The four cases examined in this paper (i.e. Sidmar, Solmer, ARBED, Estel) avoid some of these problems of generalizability, as these ventures represent all major transnational production agreements within the European steel industry.

Thus, it is principally through the use of theoretical models drawn from microeconomics, of statistical data, and of case studies that the following analytical narrative seeks to explain the institutional and economic development of the European steel community over the past thirty yearts. Proposition one is examined in sections two and three on enterprise and government responses, proposition two in section four on supranational regulation, proposition three in section two on enterprise strategies, and proposition four in section three on the impact of government subsidization on distorting investment allocation and the choice of technology. The implications of the findings for the operation of a transnational community are discussed in the conclusions.

Institutional History

The European Coal and Steel Community was the first major achievement towards the elimination of trade and investment barriers in western Europe. Within two years of the proposal of the ECSC by the French foreign minister Robert Schuman in 1950, it had been debated, contested, and accepted by the national governments. (4) The suddenness of this transformation of the economic frontiers of Europe is particularly striking in light of the historical ferocity of sentiment and combat over the territorial identity of the Lorraine and Saar region. Unquestionably, one motive behind Schuman's proposal was, in part, the conviction that Ruhr coal would once again be unavailable to France as the German economy recovered and national frontiers and prerogatives resolidified. The treaty marked, nevertheless, a turning point in the political history of intra-European relations.

If the political motives behind the creation of the ECSC have proven successful in contributing to the pacification of western Europe, the economic contribution is far more problematic. In addition to political motives, Schuman's plan was influenced by the fear of the recartelization of Ruhr industry and the recognition of the benefits flowing from the unification of Ruhr coal with Lorraine iron ore. The irony is, however, that the "natural harmony" of the region was established politically at a time when the economic value of the region's coal and iron ore was no longer viable relative to the international market. (cf. Diebold, 1959, on early history; Gordon, 1970, on the viability of coal)

Nevertheless, these considerations were reflected in the drafting and finalization of the Treaty of Paris, ultimately ratified in 1952. Structurally, the treaty established four institutions: a European parliament (of negligible power), a Council of Ministers, a regulating agency known as the High Authority, and a court. All of these institutions were later to be absorbed by the EEC. In practice, the Council proved to be the dominant force, as the Treaty established its legal right to approve or veto major policy and as its members were appointed by the national governments.

Substantively, the Treaty can be broken down into four facets: prohibitions on member states' interventions, the anti-trust provisions, supranational powers, and pricing rules. The prohibitions on the member states took the expected form of the elimination of all tariffs, of subsidies (except for regional development), of preferential taxation, and of certain kinds of non-tariff barriers (particularly on border crossings). The provision that proved particularly troublesome was that relating to subsidization. This issue has never been resolved satisfactorily in the case of coal, and it has become an increasingly sensitive area in the present European steel crisis.

The later Treaty of Rome (which established the EEC) contained a number of anti-trust provisions that were generally stricter than the various national codes, with the exception of that of Germany's. Article 85 made illegal any restraint of trade "which may affect trade between Member States." (5) Permitted exemptions were, however, quite broad, allowing for efficiency gains, consumers' benefit, and persistence of competition as reasons to justify restraint. This is far

removed in theory from the per se illegality of restraint of trade established by the Sherman Act of the United States, but in practice the difference may be narrowing. Article 86 outlawed the abuse of a dominant position, though the Commission was seemingly restricted to rule only ex post in the case of abuse arising out of mergers and acquisitions. (6) Of importance is that the treaty of the ECSC grants greater power to the High Authority --presently consolidated with the Commission of the EEC-- in the case of mergers in the coal and steel industry. The notification and authorization of the High Authority, by Article 66 of the ECSC, is a legal requisite for any merger or contract resulting in means of control. The High Authority has, therefore, greater power to influence and constrain mergers than that granted to the EEC Commission in respect to other industries.

Partly related to the above are the supranational powers granted to the High Authority to fine and subpoena (including violations of Article 66), to tax production, to borrow on international markets, and to grant loans for the purposes of investment or employment relocation. The power to tax has been especially important, as it allowed the ECSC in its early years to build up a sizeable treasury for future loans. More interesting is the interrelationship between tax incidence and subsidization. In the case of coal, the High Authority clearly taxed the more efficient mines and subsidized the less efficient, much as a cartel would operate. (Gordon, 1970, pp. 60-64) The case of steel is more complex, as the industry was less troubled until recently. Nevertheless, a similar pattern can be detected, particularly regarding subsidization in the form of concessionary loans. (7)

The provisions establishing a set of pricing rules proved to be of special importance in influencing the behavior and conduct of the industry in that it reinforced the tendency of an oligopoly inclined, as will be seen, towards collusive behavior. As Stegemann describes in his study, the history of pricing and production behavior can be well explained, as discussed below, by Stigler's defensive pricing model of a basing-point system. (Stegemann, 1977, chapter 1 & 2) The pricing mechanism of the ECSC operated on a multiple basing- point system, that is, producers were obligated to publish a list of their mill prices and then charge a buyer a price no lower than listed, plus some standardized amount representing transportation costs as a function of distance. By the word "multiple," it is meant that there exists several possible reference points, one of which each producer is expected to choose for each product. Whereas, for example, a producer of steel plates in the Ruhr would choose Oberhausen as the basing-point for this product, a Lorraine producer would choose a point such as Thionville. The territory between Oberhausen and Thionville would, then, be the natural area of competition for the Lorraine and Ruhr producers. Though, in general, a producer is expected to choose a basing-point within close proximity, this was not always the case; some producers adhered to basing-points hundreds of kilometers away. Whereas most of the discussions in favor of the founding of the ECSC took note of the natural harmony of the Saar, Ruhr, and Alsace-Lorraine area, there has, at least up to 1977, been a complete absence of joint basing-points across national borders. (Stegemann, 1977, p. 39)

Rather, despite claims by the High Authority of the relatively unmitigated success of the ECSC, the economic behavior of the industry

suggests continued strong national markets that are maintained by an explicit set of pricing rules supported by the ECSC. (Haute Autorite, 1963; see Diebold and Haas for a more qualified assessment: Diebold, 1959, pp. 708-717; Haas, 1958, pp. 106-110) As Stegemann explains, these rules can be broken down into four primary components:

1. Prices must be published and open.

2. Firms cannot exceed their list prices, including freight, from their basing points.

3. Firms can not undercut their list prices in their own basing-point regions, with certain exceptions.

4. These exceptions fall under what is called the "alignment clause" (Article 60), which permits the matching of prices against third party imports or against products of competing basing-point regions. In such cases, the producer is allowed to match the competing price (what is commonly called "freight absorption") but may not price under it.

These rules, as explained in the next section, provided for the maintenance of national markets.

Enterprise Strategies

The creation of a partial customs union instigated a number of corporate responses, as stated in proposition 1, that were influenced by the above institutional arrangements. These responses were motivated by the threat of increased competition from foreign producers of steel resulting from the elimination of tariffs. The underlying thread to these responses was the creation of trade agreements and the expansion of the size of corporate units, concomitant with a diminution in the number of steel firms. Fundamentally, these responses can be classified within two principal strategies, collusive agreements and merger activity.

Collusive agreements took a variety of forms, e.g. long-term contracts, joint ventures, trade associations, or outright cartelization. The latter is of particular interest, as there is considerable evidence that cartel arrangements have played an important role in industrial conduct. Cartelization appears to have been especially complex and resourceful in the Germany industry, which operated within the only sizeable market largely unobstructed by government interference.

As cartelization has proven to be of central importance, it is worthwhile to consider some of the theoretical aspects. Under standard economic assumptions, the optimal cartel rule is to set equal the marginal costs and marginal revenues of all firms in order to achieve maximum profits. While the fulfillment of such a rule would diminish profits of inefficient firms and raise profits of others, these distributional effects can be solved by compensatory transfers. The dilemma facing the cartel is, then, to devise procedures for determining the optimal allocation of production under conditions of uncertainty, as well as for restraining and detecting cheating. (Osborne, 1976) As the requisite knowledge of marginal costs of each plant and centralization of disciplinary powers are likely to be flawed, most cartels are imperfect in their strategy and organization. The concept of imperfect disciplinary powers is particularly critical, as discussed in section 4, in understanding recent efforts by the Commission in imposing binding production quotas.

The various national industries developed diverse institutional frameworks to solve, implicitly, the above dilemma of allocation and

enforcement. These solutions took the forms of pricing policies, sales cartelization, or collusion through joint ownership or through trade associations. Perhaps most interesting is to consider the formal and informal private ownership links between the firms as well as the role of various trade associations. (State ownership is detailed later.) The multiple interests of Societe Generale de Belgique, for example, consist of sizeable holdings of the Luxembourg corporation ARBED and of Cockerill-Ougree (13% and 19%, respectively). The Groupe Schneider of Paris is also an active participant in many of the BLEU concerns, as well as in Creusot-Loire in France (13% of ARBED, 50% of Societe Financiere Creusot-Loire). Similar sets of relations can be charted for France and, less strikingly, for Germany. In part, these ownership patterns result from the massive size of certain financial groups in Europe and the magnitude of the steel industry, in addition to the pooling of capital for investments in specialized products or in finishing plants. (8)

As is discussed later, the collusive behavior within France and Italy (and later the United Kingdom upon their entry in 1973 into the Community) arose out of the high degree of state ownership or control which resulted in effective or potential cartelization. The French market revealed, for example, a curious stability of pricing, no matter what the fluctuations in cyclical demand. Similarly, the Italian market was fairly price stable, except for the aggressive salesmanssip of the northern Italian mini-plants in Brescia. (9) (Stegemann, 1977, pp. 64-65)

The BLEU and German markets tended to rely more heavily upon

oligopolistic practices facilitated by trade associations and by the treaty price rules. While an exposition of the pricing theory implicit in these rules will not be attempted, it is worthwhile, following Stegemann's application of Stigler's model of base-point pricing, to consider the implications of the alignment clause. Effectively, this rule allows for a publicly sanctioned mode of price collusion, although admitting the possibility of potential price cutting in periods of slack demand. By the use of publicly published price lists, the industry leaders are able to ascertain which producers agressively price their products; by the alignment clause, they reserve the possibility of defensively matching an aggressive price cutter's bid. Thus, concludes Stegemann, traditional suppliers were able to maintain their markets through the use of alignment and the advantages of "goodwill," that is, of their position as established suppliers. In support of this thesis, Stegemann notes that major producers generally maintained higher basing-point prices than those of smaller "mavericks." This is evidence, he claims, that the majors were willing to sacrifice part of their market for the joint avantages of maintaining a collusive price for themselves. If the loss should be particularly egregious, a major could effectively "punish" the maverick by price alignment.

This model of oligopolistic behavior is particularly applicable, argues Stegemann, to the historical behavior of the German and Belgian industries. The Belgian market revealed price constraint among the majors, e.g. Cockerill-Ougree, but pricing behavior by the smaller firms was strikingly aggressive. Stegemann argues that this resulted from the loss of competitiveness of these Belgian producers on the world market due to the entrance of Japan and other producers. Consequently,

the Belgians were forced to turn towards Europe and undercut the established prices in order to achieve sales without the "goodwill" of conventional buyer and seller relationships within the EEC. (Stegemann, 1977, chapters 2 & 3)

In the case of Germany, trade and sales associations appear to have been of significant influence in stabilizing prices. Trade associations can be, as Dewey has recently argued, welfare improving by perfecting information flows, thereby reducing the uncertainty and risk of redundant investment and surplus inventories. (Dewey, 1979) Their use in Germany (and elsewhere) was, however, overtly conducive to the establishment of collusive sales and export agreements. Sales associations, usually owned by a large parent corporation, handle the products of several firms. As a joint sales agent, they can act as a disciplinary and cartelizing force. There were formal agreements, for example, in the case of Germany to form four Walzstahlkontore, i.e. rolled-steel selling associations, to represent German producers by regional divisions. When such associations were eventually prohibited in 1971 by the Commission, these agencies were then replaced by "rationalization groups" that were theoretically prohibited from entering into production quotas. It is interesting that this prohibition came from the Commission rather than the High Authority and may suggest a critical difference in interpretation of the ECSC by the two bodies .

In addition, export agreements have played a role in setting the conditions for cartel-like behavior. Of particular significance in the case of Germany are the export trading associations (Werkhandels). By

holding and adjusting inventories, these associations have permitted a solution to the cartel problem of how to enforce burden snaring during periods of depressed demand. Inventories are, in effect, used as buffer stocks in order to absorb excess production. Prices were, therefore, maintained, and losses on excess quantity adjustments were intermediated and spread through the sales organizations.

Similar export agreements were also made at the European level through the declaration in 1953 of the "Entente de Bruxelles." This accord was not only an export agreement, but also reflected an implicit understanding on the territorial market shares of the national groupings. Further agreements were, for example, reached during the 1970's. The French have tended not to join these international trade associations, but developed instead their own export group in 1966 under the "Plan Acier," or steel plan. In a sense, then, there appears to have been an officially-sanctioned use of export trade associations for the filtering of excess production overseas rather than disturbing internal prices and marketing (Stegemann, 1977, pp. 253-5) Indeed, this is the logical implication of the stability and high level of steel prices relative to the international market during the 1960's and early 1970's.

The conduct of the European steel industries has been, therefore, marked by transparent and tacit collusion in the setting of prices and quantities. While unquestionably associations such as the various trade groups facilitated information exchange and coordinated investment plans -- and perhaps avoided some redundancy along the lines of Dewey's argument, the general welfare effects seem to be negative in light of

the high internal prices and excess capacity. The danger confronting a a transnational community is that once these defensive mechanisms have become institutionalized, they become permanent parameters of the industrial environment. These effects are especially negative from the point of view of the purposes of integration, as the industrial agreements appeared to reinforce national territorial assignments. Though in part this criticism is vitiated by the interpenetration of trade, this trade development can be partially explained by differential growth rates (and less so by non-congruent business cycles) of the European countries. (10) (Stegemann, 1977, pp. 153-160)

The second set of responses to the creation of a partial customs union took the form of industrial consolidation and rationalization. As anti-trust law explicitly recognizes, mergers can be a substitute solution for the cartelization dilemma. A multi-plant monopolist will, in fact, follow the same optimal rules as a cartel, i.e. set equal marginal costs and marginal revenues of all plants. It would be mistaken to argue, of course, that the majority of mergers in the steel industry have been motivated solely by monopolisitc incentives. (11) What is of importance is that the conduct of one dominant firm in a national industry may be motivated by a strategy similar to that undertaken by several firms engaging in a cartel agreement. Mergers can, of course, be frequently motivated by cost savings. Even if monopoliistic power results, small degrees of cost efficiencies can easily compensate for enhanced pricing power from a welfare perspective. (Williamson, 1968)

Despite the difficulty of ascertaining merger motivations, evidence

of merger activity can provide insight into reasons underlying the persistence of national spheres of influence. The immediate impact of the creation of the customs union was a visible increase in the number of mergers in order to acheive defensible economies of scale in production. This was most notable in Germany, where the steel industry had been fragmented as part of allied policy to break the market power of the historical firms, such as Krupp, Hoesch, and Thyssen. Much of the German mergers in the 1950's were, then, only a regrouping of these enterprises according to their traditional affiliation. The EEC experienced, in general, during the 1960's, as did the United States and Japan, a remarkable increase in merger activity across all industries. Contrary to the U.S. tendency towards conglomerate acquistions, the EEC was heavily dominated by horizontal mergers (i.e. within the same industry) and by marketing joint ventures, though research and development and licensing agreements were also of importance. (Business International, 1973; de Jong, 1976; Feld, 1970, p. 28)

A large number of these mergers and joint ventures have been unquestionably motivated by efficiency gains. Most striking has been the push to the coast and major waterways, as the costs of shipping plummeted and as use of international ores and coal steadily increased. This movement has led to the creation of new steel areas, e.g. Dunkerque and Marseilles in France, Bremen in Germany, Ghent in Belgium, and the further development of Ijmuiden in the Netherlands. (It has also meant a corresponding shift of resources away from the more traditional areas of the Saar and Lorraine.)

Moreover, the development of the basic oxygen process and

continuous casting mills have increased the minimum efficient scale (MES). As a result, concentration ratios have drastically increased in order to achieve economies of scale. It has been estimated, for example, that the MES for a fully integrated steel plant is in the order of at least 6 million tons of annual steel production. (Cockerill and Silbertson, 1974, pp. 70-73) While few EEC plants have achieved more than half of this scale, the trend in new investments has definitely been toward greater size. (12)

It was in light of the growing size and competition of overseas enterprises that motivated the Commission to recommend the goal of further consolidation in 1970. Published in the Official Journal, the recommendations were based on the opinion that effective competition:

> requires that the number of enterprises of the Common Market assured of 90% of the community's crude steel production should be approximately a dozen. (The Commission) considers, therefore, that a structural evolution towards an oligopoly consisting of 12 of the large groups or enterprises --the largest attaining a share of 12 or 13% of total crude steel production-- would conform to its views. (Journal Officiel, 1970)

By 1974, almost 80% of all crude steel was produced by the ten largest firms, although plant size was still far smaller than the estimated MES. The concentration ratios (i.e. ratio of output of the ten largest firms to total industry output) were, however, all in the range of 90% for finished products, with the exception of wire rod and merchant bars. (Stegemann, 1977, pp.256-7)

Evidently, then, Article 66 of the ECSC treaty has not been narrowly interpreted. As seen in a memorandum published in the Official Journal of 1971, the Commission has sought to encourage joint ventures --especially of a multinational undertaking-- in modern works situated

on the coast. The Commission has, on the other hand, exercised its authority in the suostantive text of joint venture contracts, restricting the types of products and the location of end-sales, as well as nullifying earlier agreements where necessary. (unpublished documents)

In consequence of the intermixing of mergers with new investments and the influence of anti-trust provisions on joint ventures, it is difficult to ascertain concisely the degree to which acquisitions or production agreements are motivated by oligopolistic profits. (13) Stegemann argues that even in a 1967 memorandum, the Commission appeared as impressed by Japanese market power as by the efficiency of their plants. While this contention may indeed be right in terms of the concern over the community's declining competitiveness on international markets, it is unlikely that the Commission desired the creation of oligopolistic profits without the concomitant rationalization of the industry.

In the German case, for example, the rapid reconsolidation of the industry following the Allies' imposed fracturing of Krupp, Hoesch, Mannesmann and other steel producers was also marked by a growth in investment. Nor can closures of plants following mergers be used facilely as support for oligopolistic motivations. More often closures seem to be the result of the following situations. The acquired firm is operationg plants of varying vintage and can not raise the capital to build new plants at an efficient scale. Consequently, an acquisition is arranged with a contiguous firm that permits the achievement of scale economies in the new plant. The net present value of the project is,

therefore, positive, and the necessary capital is acquired. (personal interviews) Thus, much along the line of Williamson's argument, any welfare loss in the form of increased monopolistic profits is probably swamped by the pure efficiency effects. It is this stylized situation which appears to explain the plant closures and rationalization, for example, following the acquisition of Bochum by Krupp, Dortmunde Hoerde by Hoesch, and Niederrheinische by Thyssen (Warren, 1975, pp.63-68)

Whereas merger rates do not provide any clear information on the underlying motives, the infrequency of transnational mergers and joint ventures suggests the importance of national markets. As noted earlier, the majority of all acquisitions and joint ventures have been primarily motivated by marketing penetration, both within and across borders. (Business International, 1973) In the case of steel, there have been a number of transnational marketing arrangements, most notably with German partners on the marketing end.

Of more importance is the relative rarity of transnational production agreements, for such agreements would be expected through the achievement of an effectevely integrated market. It is not surprising, of course, that the immediate effect of the creation of a customs union should be primarily in marketing agreements. Nevertheless, the striking paucity of production agreements can not be explained by twenty-year lags in investment planning. The most notable exception to cross-border investment activity is ARBED, which has had historical ties in the German Saar and in Belgium. As to date, that have been four transnational production agreements (outside of fabricated products) in the steel industry, all originating during the 1960's: Solmer at

Fos-sur-mer in France, Sidmar in Belgium, ARBED's absorption of Roechling-Burbach in Germany, and Estel. (14)

The first two are of particular importance, as these plants were joint ventures between sizeable firms and were to embody the most advanced technology at coastal sites. (The latter two will be discussed later.) Fos-sur-mer, or Solmer, was a joint undertaking between the French concerns Usinor and Sacilor and later Thyssen of Germany. Due to the size and market shares of the three participants (see the table below), the Commission approved the joint venture --following apparent intergovernmental discussion and pressure-- if Thyssen agreed to market the finished products outside of France. It is difficult to see, though, how the prohibition of Thyssen's entry into the French market would have enhanced the conditions for competition. Rather, the logic appears to be that competitors, not competition, should be protected. Moreover, the plant was restricted to the production of flat products (i.e. coils, plates, and sheets). Despite the anticipated efficiency and size of the plant (originally planned to produce 12-15 million tons of steel), Thyssen allowed its option to purchase 25% of the shares to expire in 1978. The primary reason was the persistence of excess capacity in the steel market. But additional reasons related to potential labor problems and to the number of interventions by the French authorities. (Official Journal, 1975; personal interviews)

The failure of Solmer due partly to state intervention is, of course, not entirely surprising, given the role of the state in the French steel industry and the free market philosophy of Thyssen. More surprising was the troubled history of Sidmar, for the main partners

Group	Products	Share of the market in %		
		France	Germany	Community
SOLLAC	Coils	45·2	0·1	8·7
	Plates	19·3	6·2	6·6
	Sheets	26·2	3·7	7·4
USINOR	Coils	43·4	0·1	8·7
	Plates	37·2	0·7	8·4
	Sheets	18·5	1·6	5·1
Thyssen	Coils	1·0	43·9	14·3
	Plates	1·5	45·3	16·6
	Sheets	0·9	34·1	11·0

(source: Official Journal, 1975)

were members of Belgium and Luxembourg, two traditionally well-integrated countries. The original agreement was reached in 1966 to build a coastal plant in Ghent for the purpose of fabricating wide hot coils and plates. The signatories to the agreement were of Belgian, French, and Luxembourg nationality, the principal contributors being ARBED, Schneider, COBEPA, Cockerill, and Societe Generale de Belgique. ARBED and Cockerill were to hold 25% and 22.2%, respectively, with 27.8% being publicly offered. By the mid-1970"s, however, the group had disappeared and ARBED became the only survivor. Cockerill had developed severe financial troubles, and ARBED was willing, in fact preferred, to control Sidmar by 100% ownership. (Apparently, COBEPA, Societe Generale, and Schneider also agreed to sell out, but the latter two hold, as noted before, sizeable interests in ARBED.) Interestingly, ARBED was not able to acquire a 100% interest in Sidmar, as the Belgian government demanded 22% ownership as part of its devolution policy. The one case of a transnational joint venture in fulfillment of the Commission's recommendations is, ironically, the consequence of state

intervention motivated by unusually regional concerns.

National Government Interventions

The interaction of the strategic behavior of firms through collusion and mergers and of governments through their fiscal interventions --as seen in the cases of Solmer and Sidmar-- shaped, consequently, the evolution of the European steel industry. National boundaries not only coincided with the influence and politics of the various governments, but also provided convenient demarcations for market segmentation, as witnessed in the absence of transnational ventures and cross-border basing-points. Furthermore, the interests of the industry and government were often one and the same, as the state holds substantial control in most ECSC countries. (It should be noted that state ownership resulted not principally from the aftermath of World War II, but evolved steadily over the thirty year history of the community.) British Steel Corporation is state-owned and represents over 90% of all steel production. Nearly 50% of Italian steel is produced by state-owned Finsider and Italsider. Hoojovens, of which the Dutch government and the city of Amsterdam own 37%, produces over 90% of Dutch steel. The Belgian government is also heavily involved, holding 29% of Cockerill, 10% of Carlam, and 22% of Sidmar. Its involvment will certainly increase as well in the near future. Through direct participation and through state-owned bank holdings, the French government is the dominant voice in Usinor and Sacilor, and it also holds a preponderance of their debt. Even the German government, which has been influenced by the free market policy stemming from the Erhard era, owns outright Salzgitter, one of the top five German producers.

Structurally, the national industries are also different, with Germany at one end of the spectrum. The Dutch, British, and Luxembourg markets are almost completely dominated by one firm, the French by two --though a state- arranged merger is apparently in the winds, Belgium by a few majors and a decreasing number of smaller firms. The Italian market is also dominated by two firms, but consists of a large and highly competitive fringe of small producers. Only the German market consists of several large and efficient producers.

In part, this variation stems from the weakness of the national anti-trust laws. France, for example, has adopted over the years a number of anti-trust provisions along the lines of Germany and the United States. These provisions are, however, rarely enforced, as the French government has pursued actively a policy of encouraging mergers and further consolidation. (Jenny and Weber, 1977) Whereas the Cartel Office of Germany, which is the functional equivalent of the American Federal Trade Commission, has been permissive in its tolerance of such activities as the Kontore (i.e. the German marketing associations during the 1960's), it is unlikely that mergers between the majors would have been accepted.

From the perspective of the theory of cartel and multi-plant monopoly, the collusive arrangements in the German industry and national interventions in the others represent two alternative regimes for effecting similar outcomes. Both regimes resulted in the centralization of concerted market power. Yet, if cartelization and government regulation are alternative regimes, to what extent did the German and other markets differ? In terms of pricing conduct, the German market

reveals high prices, though international competition established a constraining ceiling. (During 1980, however, price competition between Thyssen and Kloeckner has been remarkably stiff.) Moreover, it has been the state-owned enterprises, especially the French, that were often the most aggressive price cutters, as stable employment appears to have been the primary concern. (Stegemann, 1977, p. 110)

The real difference appears to be not, however, in the conduct, but in the performance, as suggested by our fourth proposition, of the various steel industries. The persistent use of subsidies and indications of sub-optimal investments are evidence of the dynamic differences between the German and other European industries. While subsidization (except for development or relocation) is illegal according to the ECSC treaty, it has been a perennial feature of both the coal and steel industries. (The average subsidy in the EEC on home coal was $1.70 per ton relative to the world price in 1967. (Warren, 1975, p. 163)) Favored by growing world demand, steel production did not require comparable subsidization until the 1970's. (15) While the number of steel exporting countries has apparently doubled between 1950 and 1975, European demand has gradually declined in growth. (Peco, 1971, p. 240; calculation is based on estimate for 1975) Reaching a peak production in 1974 of over 150 million tons, total EEC crude steel production has since fluctuated below this level. Furthermore, the relative shares of the national industries have changed drastically in terms of annual production, though total capacity shares are much more stable. (see table 1)

What is most striking from the table below is the failure of the

Original ECSC countries	Production (in million t)	Change (in %)	
	1978	1978/77	1978/74
Federal Republic of Germany	41.241	+ 5.8	− 22.6
Italy	24.253	+ 3.9	+ 1.6
France	22.842	+ 3.3	− 15.4
Belgium	12.604	+ 12.0	− 23.3
Netherlands	5.582	+ 13.4	− 4.4
Luxembourg	4.790	+ 10.6	− 25.7

(source: ARBED, Annual Report, 1978)

German producers to defend their markets and the growth of Italian production. As protests over this change in market shares has motivated the recent imposition of mandatory minimum prices for some products, it is important to consider the growth of the Italian share. The strength of the Italian industry rests primarily on the performance of the Bresciani, which are producing one-half of all Italian steel out of electric furnaces. While the installation of electric furnaces can be complementary to oxygen blast plants through their high use of scrap steel, this complementarity does not explain the tremendous growth and profitability of these furnaces in northern Italy relative to other national or regional areas. In part, their success is derived from the efficiency of their plants and the aggressiveness of their marketing. At the same time, however, their performance has been peculiarly contingent upon the availability of low cost scrap supplies (the major input into electric furnaces) and upon the persistent excess capacity of the European majors. In a market operating at full capacity, their profitability would have been lessened.

This claim can be partially explained by a standard limit pricing model. This model demonstrates that a dominant firm with a cost advantage will set prices between the pure monopoly price and the limit price, or at a point where all competitors can not profitably produce. If the dominant firm decides upon a limit price, entry is excluded but profits are lower; if it decides upon the monopoly price, short-run profits are maximized but entry results. The puzzle in the case of the German producers is, however, that prices were maintained higher relative to other markets and yet profits have been depressed despite apparent cost advantages arising from plant size.(16) Nor does the model explain why the new firms have entered with electric-furnace technology. Between 1973 and 1978, electric furnace capacity has increased in Italy by 6.3 million tons while total capacity has increased only by an additional 1.3 million tons; of this 6.3 million tons, all but .5 million tons has been located in northern Italy. (ECSC, 1975, 1978) (see tables 2, 3, & 4) In light of the general consensus concerning the cost efficiency of a large integrated oxygen plant, why were these incremental capacity additions not achieved through the installation of one large plant?

One possible explanation is of particular interest, as it reflects the critical ramification of national subsidization schemes upon other national markets in terms of profitability. The large basic oxygen plants (which can use only small quantities of scrap and thus have eased supply conditions for the mini-plants) are generally considered more efficient at full capacity. But due to the high fixed costs of the capital investment and low marginal costs, the curvature of the average unit cost is more elastic than that of the mini- plant which operates

under low capital but higher marginal costs. (see figure 1) As a result, during periods of low demand, the lower utilization rates are especially damaging to the profitability of the larger firms.

While the short-run failure to meet average costs can be compensated through excess profitability during demand peaks, the stagnation of demand since 1974 and the high excess capacity of the industry, as shown in figure 2, has resulted in long-term depressed profitability. Due to apparent cartel pricing in the home market and the closure of other large markets (i.e. the Italian, French, and British), the German majors have assumed the burden of output adjustment relative to the other national industries despite the recognized efficiency of their plants. (see tables 5 and 6 on utilization rates) The Bresciani on the other hand, are particularly well-positioned and equiped for the present environment. Able to withstand output fluctuations and to price profitably under the German umbrella price, profits have been sufficient to encourage persistent entry. The mini-mill has been, in consequence, a technology well-suited to the conditions of a large oligopolistic market constrained by internal collusive agreements and by external closure of other large markets.

It is particularly in light of this situation that government subsidies encouraging persisting over-capacity have been so devastating. Although the German industry has been marked by collusive and oligopolistic behavior, the nature of the underlying agreements have been imperfect, that is, collusion has required implicitly the imposition of a set of enforceable contracts. Such a set has been available through the joint services of trade associations and sales

organizations. While fixing prices and quantities, these contracts have, however, not prevented competition in the form of new investments and rationalization of plants. Though other national industries have increased plant size and replaced obsolescent plants (Finsider is especially prominent in this regard), rationalization and technological improvements at all stages of production have historically been more rapid in the German industry, though this has been less true for the 1970's. (17)

The Belgian and the British industries are especially heterogeneous in plant size and technology. Belgium had, for example, no continuous casting unit until 1973, and is still deficient in this regard. (see tables 7 and 8) The United Kingdom had an output of near 27 million tons in the 1960's, but as the Benson Report made clear, this output was derived from a remarkably diverse set of plants, with a large number clearly not profitable. The Report concluded that production should be centralized and increased by one-third. (Warren, 1975, p. 63-68) Progress was not forthcoming and despite proposals to expand capacity as recently as 1978, present plans are being considered to cut production possibly to as low as 15 million tons. (ECSC, 1979; personal interviews with EEC officials)

Investment efficiency is not only a question of technology and plant size, but also, among other factors, of location. The role of subsidization and intervention by national governments has served to slow the replacement of less efficient plants and to finance new investments without concern for the optimality of location. (Significant exceptions do exist, however, as in the case of some of

Finsider's coastal sites as well as in British Steel's more recent plants.) Accordingly, French investments have been heavily concentrated between 1976 and 1978 in the traditional steel region of eastern France, despite an earlier trend towards investing in coastal sites. Moreover, prior to the crisis of the mid-1970's, both French and British policy were marked by commitments to ventures that were suboptimal in scale for reasons of regional policy. (see examples given by Warren, 1975, p.165 and Cockerill and Silbertson, 1974, p. 54)

The continuance of investment in traditional areas is not, of course, limited to countries other than Germany, for two of the more interesting cases are the concessionary loans granted to two transnational enterprises, ARBED and Estel. Incorporated in Luxembourg, ARBED has long been active in the German Saar, becoming the dominant firm in the region with the acquisition of Roechling-Burbach in the 1960's. Relying upon German coal and Lorraine iron ore mixed with higher grade ores from Brazil, ARBED has committed itself -- with the exception of Sidmar-- to the Saar and Luxembourg region. (It also owns and operates iron facilities in the Lorraine, which are considered to be of questionable economic value.) In light of ARBED's leading role, the German government has granted the enterprise a series of concessionary loans to remodernize its Saar works; it is unlikely that ARBED would have undertaken, or would have received the investment capital for these investments without state aid. (Annual Report, ARBED, 1978; personal interviews) These loans have had a major effect in increasing the share of the Saar in the total capital outlays of the German steel industry. Less than 15% of total German outlays between 1973 to 1977, the Saar's share climbed to over 40% in 1978 and 1979. (ECSC, 1975, 1978; 1979

figures are based on estimates; see table 9) Furthermore, as an employer of one-third of Luxembourg's industrial labor force, ARBED has worked closely with the Luxembourg government and trade unions to maintain and streamline their home plants.

Estel is not only transnational in production location, but also, in ownership, as the Dutch Hoogovens and the German Hoesch fully merged in the 1970's following their successful joint investment in expanding the Ijmuiden works near Rotterdam. The origins of their cooperation lie in their interests in the Dortmund-Hoerder Huetteunion works, which Hoesch acquired in the 1950's. This project resulted in Hoogovens holding a 14.5% interest in Hoesch. In the mid-1960's, as Hoogovens contemplated expanding its production, the two decided upon joint capitalization in order to avoid investment redundancy and to spread the capital risk. As a result of the agreement, Hoesch renounced any intent to invest in similar production lines in the Dortmund area with the assurance of a percentage of the Dutch production of crude steel and semi-fabricated products. (unpublished documents) The agreement resulted in a full merger of the two units in 1972.

The German works have not, however, attained the efficiency of the Dutch plants. Yet, due to employment and equity issues, Estel has seemingly been constrained to allocate production in equal amounts to both units, even though the Ijmuiden works are not working at full capacity and the Dortmund works are not fully integrated and have some open-hearth furnaces. Moreover, the coastal advantages of Ijmuiden appear compelling, as Estel has hesitated to invest further in the interior Dortmund location. (Thyssen operates out of Duisburg, which,

though near Dortmund, is much better accessed by waterways leading to Rotterdam.) Recently, however, Estel has decided to build a new basic oxygen steel plant in Dortmund to replace the three older furnaces subsequent to the provisioning of concessionary loans financed by the central and state (North Rhine Westphalia) governments. (World Business Weekly, April 1980; Der Spiegel, 1980) (18)

Both the ARBED and Estel cases are illustrative of the poignancy of the regional labor problems in the steel industry. While excess capacity and technological obsolescense hinders the allocative efficiency and reorganization of European steel, no European government, not even apparently the German, can withstand the immediate employment implications. The Hoesch closure would have meant a loss of 10,000 to 15,000 jobs, while the new plant will employ 4,200 fewer workers. Some countries are in even more dire straits. Whereas Germany had staggered its cuts over a number of years, France and Belgium are forced, due to the magnitude of the present crisis, to change their subsidy policies and streamline their work force. France already laid off 12,000 workers in 1978-79, and 20,000 more jobs are to be eliminated by 1981. (World Business Weekly, March, 1979; April, 1980)

The lack of an effective community policy has had its consequences in both investment and employment. As noted before, the high capital costs and persisting excess capacity resulting from subsidization increased uncertainty of investment decisions. A new investment represents two negative consequences for the investing firm. One is that a new plant effectively reduces the firm's flexibility in output decisions; risk increases, as is well known, with operating leverage

(i.e. the ratio of fixed assets to cash flows). Secondly, a new investment renders old plants redundant. There is, however, value in owning a portfolio of technologically heterogeneous plants, as the marginal labor in the less efficient plants is an important bargaining chip in extracting government subsidies. (19)

From this perspective, governments have been more concerned in establishing exit barriers than in eliminating entry barriers. Firms and governments have tended, in consequence, to trade-off their hostage positions. Plants are reconstructed in traditional sites --though alternative investments are more promising-- and employment is reduced, but not eliminated in return for government subsidization or tolerance of oligopolistic power. Though this is a second-best outcome relative to the location of new investments accessed by waterways and by industrial markets, some outcomes have been clearly of lower welfare ranking, such as persistent subsidization. But this policy is obviously unstable in the long-run, as all governments choose or are forced into similar programs. The 1978 Annual Report of Estel --prior to its eventual receival of the Hoesch plant loan-- observes:

> ...the competitive position of private-owned steel companies in the European Community vis-a-vis state -owned or state-controlled steel industries is weakened. We are therefore concerned at the continuing lack of agreement on a European code of subsidies. In the light of these developments, we consider that the German and Dutch governments have the duty to keep the interests of their national industries firmly in view. (Annual Report, Estel, 1978)

And apparently the German government agreed.

Supranational Regulation

The persistence of national markets and government intervention and subsidization poses the question of the extent to which sufficiently powerful transnational institutions were established. In light of the dismal record of European cooperation in the area of steel, the general conclusions regarding the role of the High Authority and later the Commission during this period have been unquestionably negative. Gordon argues, for example, that the High Authority was in conception a powerless institution, as the national governments could control major policies through their appointed representatives to the Council of Ministers. (Gordon, 1970, pp. 48-9) Another argument might be that the ECSC displays many of the features described by traditional "capture theory;" the regulators were recruited from, or identified themselves with, the regulated industry.

Both arguments have, as to be expected in complex issues, their elements of truth, but both fail to explain the evolutionary behavior of the Community during the past 25 years. There is, moreover, a noted tendency to praise the Community in strong years, condemn it in lean years. Many of the early commentators on the ECSC were impressed by the reduction of excess capacity and modernization of the European plants through the 1950's and 1960's. It would be difficult to argue, however, that these results were the primary or even partial result of the ECSC's creation. On the contrary, the ECSC was unusually favored by excess demand resulting from the Korean war, and later by the unusual growth rates and consequence demand of the various national economies. For those industries, e.g. the Belgian, which were not sufficiently

modernized, the problems remained endemic and required persistent subsidies. (Diebold, 1959; Haute Autorite, 1963; World Business Weekly, April 1979) Though even in the late 1960's excess capacity became noticeable (encouraging at the time the creation of the German Kontore), it was only in the 1970's that the inefficiencies were no longer supportable.

Whereas the High Authority followed a largely passive role in the 1960's and enacted few fines for violations of pricing rules, a perceptible shift in policy occurred subsequent to the consolidation of the ECSC and the EEC. (Stegemann, 1977, p. 240) During 1970-71, the Commission ruled the Walzstahlkontore (or rolled-steel selling associations) as illegal, established a general guideline for efficient concentration, and recommended the creation of transnational joint ventures to displace capacity in the more poorly situated interior regions. Despite this initial activism, the Commission's hopes were frustrated in the early 1970's through the continuing display of national interests. Although concentration ratios were near the level sought by the Commission, there was little evidence that investment allocations were being made in regard to a European market. To the contrary, product specialization has not resulted, as every national grouping continues to offer a complete spectrum of steel finished products. (Cockerill and Silbertson, 1974, p. 50)

It is this environment that explains the Commission's tolerance of Thyssen's involvement in Solmer. (One can not imagine the Federal Trade Commission approving the equivalent venture between United States Steel and Bethlehem Steel to produce jointly 10% of American steel!) The

Commission's backing of Eurofer, which is the consultatory trade association of the leading European steel producers, reflects equally the desire to mitigate the regionalism of the steel industry, though the implications of restraint of trade are apparent. (personal interviews) Although unable to interfere with investment plans or counteract national policies, the Commission's influence grew as the various national governments and industry leaders came to perceive the need for a supranational brokerage house. Thus, it has been during recent years that two supplementary plans were negotiated and approved by the member governments, the Simonet and the Davignon.

The Davignon Plan is of the greater interest, as its acceptance in 1977 susperseded that of the former Simonet Plan. Basically, it provides for minimum prices and import quotas for non-EEC countries in the short run and for a radical reduction of obsolete plants and of the steel labor force over the next few years. The short-term plan is, essentially, therefore, the solution to the free-rider problem posed by the Bresciani and subsidized enterprises; the cartel is perfected and made inclusive of all producing agents through the sanctioned imposition of binding rules of discipline. (20) Although at present minimum prices are fixed for only concrete reinforcing bars, merchant bars, and hot-rolled wide strip, there exist recommended guidelines on other products as well. (Official Journal, December, 1979) The short-term plan has been successful in returning some profitability to the industry, though fabricators of specialized steels and other products have yet --to their dismay-- to be covered. (unpublished documents)

The long-term objectives have, however, fared less well. The

short-term measures have been sufficiently successful as to diminish the impetus for the labor cuts; announced layoffs have, as of August 1979, numbered only 50% of the projected schedule. (World Business Weekly, August 1979) Unable to allocate new investments, the Commission relies upon its weak incentives and penalties, offering funds for worker relocation and training and denying loans for redundant investment projects. (21) The Commission has, therefore, relied upon two remaining instruments to force some semblance of compliance. One instrument is the fixing of minimum prices, for clearly the Commission can threaten to lower or even eliminate mandatory prices. (The prices have already been established to reflect average costs of the typical plant. (Joliet, 1979)) Secondly, the Commission has the power to impose fines for certain kinds of activities. Its recent imposition of $1.3 million on leading French and German producers was based on the conclusion that "interpenetration, price fixing, and quota agreements amounted to 'illegitimate regulation of the market.'" (World Business Weekly, April 1980) While the charge is probably well-founded, its timing raises a more subtle and significant point: the present level of cartelization will not be tolerated as a long-term solution to the crisis.

In view of the return to excessive stockpiling and unrestrained price competition, the Commission has recently moved to strengthen its supervisory powers. It is likely, if current summit discussions fail, that the Commission will invoke Article 58 of the Treaty of Paris by declaring a "manifest crisis" that would permit direct regulation of production. (see Joliet, 1979, on Article 58) Doubting either the efficacy of competition, or the forebearance of governments to permit the elimination of inefficient plants and firms through the market

place, the Commission has decided apparently that cartelization of the industry under its own aegis is preferable to the alternative cartelization and subsidization by each of the nine governments and national industries.

It is, moreover, noteworthy that the Commission has tried to achieve its recent goals through the abandonment of the free market principles inherent in the Treaty of Rome. Stuart Holland has recently argued that the treaty, unlike its working paper predecessor, the Spaak Report, paid insufficient attention to the requirements of political mediation in order to adjudicate complex social and economic questions. (Holland, 1980) By formulating the definition of market integration through prohibitions, the designers of the Treaty failed to endow the Commission with sufficient powers to mediate in the operation of the Community. Certainly, in the case of steel, as proposition two suggests, Holland's contention is well supported in light of the High Authority's and later the Commission's inability to influence effectively the allocation of investment. And ironically, the recent measures have been achieved not through the institutional channels outlined in the Treaty, but through high-level summitry of the member governments.

Whether or not the Commission succeeds in establishing its long-term goals for the steel industry, the recent measures will have durable effects by the force of the present crisis. Employment in the steel industry has declined by over 100,000 jobs during the last few years, 38,000 positions in France alone. With total EEC steel employment near 655,000, France plans to eliminate 11,000 jobs next

year, while British Steel plans to lay off 52,000 this year. (World Business Weekly, October 1980) Governments are committed to the painfully-achieved objective that older plants must be closed. Nevertheless, the implications of the transitional investment policies of the various governments are of little countervailing importance. While there has been a shift to the coast, the traditional regions of the Saar and Lorraine will not be abandoned. Concessionary loans and state investment have assured a continuing, though reduced role of these regions in the future of European steel.

Conclusions

The steel industry is of particular national sensitivity. It would be, then, an unwarranted extrapolation to generalize from the above observations to the EEC as a whole. The ECSC is, however, of unusual importance in itself, as a chosen engine of European integration and a historically central sector in the economies of Europe. It is of interest, therefore, to consider in conclusion the degree of political and economic integration in the steel sector.

From the perspective of the above discussion, the ECSC can be viewed as a partial custom union with ambiguous welfare and integrative implications. As Tibor Scitovsky argues, the creation of a customs union should have several welfare effects, two of which are a more efficient allocation of resources and enhanced competitiveness. (Scitovsky, 1958, pp. 132-38) Yet, as seen, both governments and enterprises have been unable to tolerate the implied adjustment costs. Some markets, especially that of the German, have relied upon a complex

system of price and output agreements; the remaining have tended towards greater reliance on subsidies and ultimately nationalization to achieve similar static ends. (The dynamic effects are, as argued previously, differential in terms of investment strategies.) Both trends --industry collusion and government intervention-- have been either reinforced by treaty provisions, e.g. the basing-point system, or ignored due to a lack of will or power on the part of the High Authority and the Commission.

There is, then, a contradiction between the commitment to an economic community and the political refusal to permit traditional industries to decline significantly. Only the occurence of prolonged excess capacity and depressed profitably has been adequate to force major reductions in the steel labor force. While this refusal is perhaps reflective of the welfare trade-off between economic and social values, this conflict can not be the complete story, as an accommodation between these values through transnational ownership and product specialization has been frustrated through the persistence of national identities. "It is interesting to note," comments Assar Lindbeck, "that protectionism has been most difficult to remove in the fields where free international competition would have led to intersectorial rather than intrasectorial reallocation of resources, such as in agriculture and labor-intensive products." (Lindbeck, 1977) Though Lindbeck's observation was made in reference to EEC policy towards third-party countries, it applies equally well to the ECSC; few governments, until recently, have contemplated a radical reduction of the industry itself.

More troubling has been the refusal to allocate resources intra-

sectorially as well. Specialization is especially difficult to measure. The Netherlands, for example, entered the ECSC with a low level of production and, thus, high specialization. Currently, the Netherlands does not produce hot-rolled sheet. It would be misleading to claim, then, evidence for product specialization without considering the historical record. Even so, there are very few cases where a product is not fabricated by a national industry. Whether product specialization will occur in the future is more problematic, as some corporations are considering currently the narrowing of their product lines.(ECSC, 1975, 1978; personal interviews)

Not only has product specialization been of low order, but trade interpenetration and specialization has been of dubious value. Stegemann's argument is that interpenetration was the result of differential rates of growth and sectoral business cycles. It is, of course, difficult to measure integration by trade statistics. Given, however, the historically higher prices that prevailed in Europe relative to the rest of the world, the interpenetration observed in the steel markets appears to be the result of the diversion rather than the creation of trade. Nor does trade specialization seemed to have resulted, with the exception of steel tubes, which is outside the purvey of the ECSC.

From this point of view, the economic welfare effects of the ECSC are complex but seemingly of low magnitude. Much as Owen and Brauetigam suggest, governments and agencies behave to buffer the forces of change and provide due process for affected groups. (Owen and Brauetigam, 1979, chapter 1) Certainly, in consideration of the proportions of

national labor forces employed in steel in Luxembourg and Belgium and in the regions of the Lorraine, the Saar, and the Ruhr, governments were forced to intervene to some extent against the shocks inherent in the creation of a customs union. The pertinent question has been, however, the duration and the nature of these interventions. Interestingly, it is the German industry, which is relatively free of government subsidies (though as suggested, this was obviated in part by the history of collusive behavior) that has been more successful in streamlining its labor force and in its investment strategy. Few other European governments could have abstained as successfully as did the German from responding to a labor dispute of the intensity as that associated with the 1976 German steel strike. (Thimm, 1979) The political parameters of institutional expectations and stability are of subtle but critical significance.

Enterprises have responded strategically in different ways to the present crisis. Some have appealed directly for national aid; both the French and the Belgian industries are in process of a radical reorganization under the direction of the national governments. Others, such as Thyssen, have diversified their products and line of business. A third group has steered a third path, accepting state aid but maintaining independence from government direction. Yet, with the exception of ARBED and Estel, all of these strategies remain constrained by national borders.

The role of the High Authority and later the Commission in mitigating these persisting regional and national policies has been of minimal importance. The High Authority in particular revealed little

capacity or will to increase European competition or effect a reallocation of investment. (22) Perhaps the ECSC was designed more as a Trojan horse than Troy itself. Once the elimination of all intra-EEC tariffs was achieved in 1968, the Commission, having absorbed the High Authority, was able to be more strident in its guidelines and recommendations, as seen in its ruling on the Walzstahlkontore.

Nevertheless, this new stridency was not only powerless relative to the interventions of national governments, but too late. The Commission's call for transnational mergers and joint ventures and its support for Eurofer are reflective of the latent recognition of the absence of, and need for a European industrial constituency. Lacking such a constituency, the Commission is left in the position, not of coordinating, but of arbitrating between the divergent interests of the national states. Its true powers have been shown to be crisis contingent. It can not be of much comfort that the Commission's influence waxes as the fortunes of European industry wane. The resulting irony is not lost on the designers of the Davignon Plan. In advancing towards the rationalization of the industry, the achievement of a more fundamental goal was bypassed: the creation of a European steel industry.

Footnotes

1. The terms structure, conduct, and performance have a precise meaning within the discipline of industrial economics. Structure refers to such elements as buyer and seller concentration and entry barriers, conduct to pricing behavior plant investment, and product stategy, and performance to allocative efficiency. (Scherer, 1980, pp.4-6)

2. There already exists in the literature an excellent study within the framework of industrial economics on European steel. This is Klaus Stegemann's Price Competition and Output Adjustment in the European Steel Market. Much of the information on collusion and price patterns is drawn from Stegemann's work.

3. The following discussion has been greatly aided through the suggestions of Professor Stephen Kobrin of New York University.

4. They were the Netherlands, the Federal Republic of Germany (henceforth Germany), Belgium, Luxembourg, France, and Italy. The United Kingdom chose to abstain until further consideration.

5. As Barounos, et.al. point out the French version ("susceptible d'affecter) was more general than the English implication of the phrase "may affect" as the former implies more clearly that the mere probability of affecting trade is sufficient for illegality. (Barounos, 1975, p.26)

6. This perhaps is in the process of changing, as the Continental Can decision apparently provided for the right of the Commission to review proposed mergers. It is not clear, however, whether this right will prove effective in future cases.

7. As might be expected, some of the efficient steel enterprises were not enthusiastic over the end-use of their tax payments --that is, to reorganize faltering firms or provide investment loans to less efficient

rivals. It was the policy of one major company, in fact, to accept concessionary loans in the amount offsetting the value of its tax contributions. (personal interviews)

8. These mini-mills, often referred to as the Bresciani, use electric furnaces and thus are primarily producers of specialty steel from scrap supplies and at a low scale of production, that is, below 500,000 million tons annually.

9. The above discussion was greatly facilitated by information provided by ARBED. Not discussed in the above is upstream cooperation. The Bong mine, for example, in Liberia is jointly owned not only, as Vernon and Levi note, by German firms, but also, by Dutch through Estel's participation. (Vernon and Levi, 1980)

10. More importantly, interpenetration does not measure the welfare gain of integration, as the increased commerce may be an outcome of trade diversion rather than trade creation. In other words, the intra-community trade may largely represent trade that would go overseas in the absence of the community.

11. Due to spatial market differentiation resulting from a basing-point system, mergers motivated by monopolistic advantages would be probably between geographically contiguous firms. This is not easily testable, however, as mergers motivated by economies of scale in steelmaking are also a function of spatial contiguity.

12. The exception is, of course, the mini-mill which is efficient at a

drastically smaller scale (0.1-0.5 million tons). One-half of Italian production is derived from these mills, primarily under private control. Nor is it always optimal to rebuild new plants, as the technology exists to reconvert the old Thomas and Martin processes to oxygen processes. (Carlsson, 1977) This is one reason why it is difficult to infer technological efficiency from the breakdown of plants by processes alone.

13. This information is derived from interviews with EEC officials. Exact figures are apparently not consolidated.

14. Lawrence Franko claims that there have been five, without listing names. It is likely that the fifth is a reference to a joint finishing plant or marketing agreement, or perhaps even to the manufacture of tubes, which is, due a historical oddity, outside the purvey of the ECSC. (Franko, 1976, pp. 142-5) There has been, in addition, some agreements between Korf and French and Italian producers for the construction of mini-mills.

15. Exact figures on subsidization are not currently available. In the event of the publication of the papers and proceedings of a recent OECD symposium on the steel crisis, more information will perhaps become available. Subsidization can, of course, take several forms --such as direct grants or the conversion of debt into equity by the state--, which adds to the measurement problems.

16. Profit information is derived from interviews and the annual reports of the major corporations.

17. The major exceptions have been the Saar region and the Dortmund works, both of which will be discussed later.

18. The acceptance by ARBED (the first to break industry policy against state aid) and Estel of state subsidized loans received strong responses from the Industry Club of German steelmakers. It had been the industrialists' policy to avoid outright investment subsidies, though subsidies for research and development and downstream shipbuilding have long been on record, including such free-market advocates as Thyssen. Thyssen's chief executive Dieter Spethmann was especially incensed over the Hoesch subsidy, as the latter's chief executive Detlev Rohwedder presumably relied upon his ties as a previous SPD representative to the state parliament. (Der Spiegel, 1980)

19. Professor Carliss Baldwin of MIT has expressed a similar argument in conversation regarding the use of obsolescent plants by American firms to restrain labor militancy and wage demands.

20. While the Commission has been able to set prices along the lines of a cartel agreement, this power is derived from the ECSC treaty. Similar attempts within the synthetics fiber industry, which is covered by the EEC treaty, were ruled illegal by the Court. (Joliet, 1979)

21. The refusal to grant loans is not a sufficient stick, but the refusal itself, it is often claimed, has an effect upon alternative sources of capital. While this effect is likely to be pronounced for an enterprise suffering from low profitability, its impact is negligible on

the investment financing sources for the larger successful and state-owned enterprises. In short, the Comission can make money tighter only when it's already tight. (personal interviews) 22. Jack Hayward, writing in 1974, has argued, moreover, that the Commission in its early years was as weak as the High Authority relative to the other pertinent powers. "Of the three planning organs --the High Authority, the national governments, and the big firms--," writes Hayward, "the High Authority and its successor, the EEC Commission, had the least influence upon the long-term development of Europe's coal and steel industries." (Hayward, 1974)

BIBLIOGRAPHY

Books and Articles

Barounos, D., Hall, D.F. and James, J. Rayner, EEC Anti-Trust Law: Principles and Practice, London: Butterworths, 1975

Carlsson, Bo, "Economics of Scale and Technological Change: an international comparison of blast furnace technology," Welfare Aspects of Industrial Markets, ed. A.P. Jacquemin and H.W. de Jong, Leiden: Martinus Nijhoff, 1977

Cockerill, Anthony, in collaboration with Aubrey Silberston, The Steel Industry, Cambridge: Cambridge University, 1974

de Jong, H.W., "Theory and Evidence Concerning Mergers: an international comparison," Markets, Corporate Behavior and the State, ed. A.P. Jacquemin and H.W. de Jong, The Hague: Martinus Nijhoff, 1976

Dewey, D., "Information, Entry, and Welfare: The Case for Collusion," American Economic Review, (September 1979)

Diebold, William, The Schuman Plan: A Study in Economic Cooperation 1950-1959, New York: Praeger, 1959

Feld, Werner, Transnational Business Collaboration Among Common Market Countries: Its Implications for Political Integration, New York: Praeger, 1970

Franko, Lawrence, The European Multinationals: A Renewed Challenge to American and British Big Business, Connecticut: Greylock, 1976

Gordon, Richard, The Evolution of Energy Policy in Western Europe: The Reluctant Retreat from Coal, New York: Praeger, 1970

Haas, Ernst B., The Uniting of Europe: Political, Social, and Economic Forces 1950-1957, Stanford: Stanford Press, 1958

Hayward, Jack, "Steel," Big Business and the State: Changing Relations in Western Europe, ed. Raymond Vernon, Cambridge: Harvard University Press, 1974

Holland, Stuart, Uncommon Market: Capital, Class, and Power in the European Community, New York: St. Martin Press, 1980

Jenny, F. and Weber, A.P., "French Anti-Trust Legislation: an Exercise in Futility," Welfare Aspects of Industrial Markets, ed. A.P. Jacquemin and H.W. de Jong, Leiden: Nijhoff, 1977

Joliet, Rene, "Fixation des Prix, Cartels de Crise et le Regime de Concurrence dans la Communauté européene," paper presented at seminar of Commission Droit et Vie des Affaires, Liège, October 18-20, 1979

Joskow, Paul L., "Firm Decisionmaking Processes and Oligopoly Theory," American Economics Review, Vol. 65, May 1974, pp. 270-9

Lindbeck, Assar, "Comments," International Allocation of Economic Activity, ed. Bertil Ohlin, New York: Holmes and Meier, 1977

Osborne, D.K., "Cartel Problems," American Economic Review, December 1976

Owen, B.M. and Braeutigam, R., The Regulation Game, Cambridge: Ballinger, 1978, ch. 1

Peco, Franco, L'Acier Face aux Theories Economiques, Milan: Nuove Edizoni Miano, 1971

Scherer, F.M., Industrial Market Structure and Economic Performance, 2nd ed., Chicago: Rand McNally, 1980

Scitovsky, Tibor, Economic Theory and Western European Integration, Stanford: Stanford Press, 1958

Stegemann, Klaus, Price Competition and Output Adjustment in the European Steel Market, Tubingen: J.C.B. Mohr (Paul Siebeck), 1977

Thimms, P., "The German Steel Strike of 1978/79: Implications and Consequences," The Columbia Journal of World Business, Vol. 14, No. 1, September 1979

Vernon, Raymond and Levy, Brian, "State-owned Enterprises in the World Economy: The Case of Iron Ore," draft paper, January 29, 1980

Warren, Kenneth, World Steel: An Economic Geography, New York: David & Charles, 1975

Williamson, O.E., "Economics as an Anti-trust Defense: The Welfare Tradeoffs," American Economic Review, Vol. 58, March 1968

Documents

Corporations

ARBED, Annual Report, 1978

, Les Liaisons Financieres des Principaux Groupes Siderugiques Europeéns

Estel, N.V., Annual Report, 1978

European Econonic Community

European Economic and Steel Community Commission, Investment in the Community Coalmining and Iron and Steel Industries, Reports: 1976, 1979

Haute Autorité, "La CECA 1952-1962: Les Premières 10 Anneés d'une Integration Partielle," Bulletin de la Communauté Europeene du Charbon et de l'Acier, Luxembourge: ECSC, 1963

Journal Officiel des Communautés Européenes, Volume 13, No. C 12, January 30, 1970, pp. 5-8

Journal Officiel des Communautés Européenes, Volume 14, No. C 96, September 29, 1971

Official Journal of the European Communities, Volume 18, No. L 49, February 25, 1975, pp. 13-20

Official Journal of the European Communities, Volume 22, No. L 344, December 31, 1979, pp. 1-14

Periodicals

"Krach unter den Bossen," Der Spiegel, March 29, 1980, pp. 71-74

"Steel Threat to 'Austerity' Plan," World Business Weekly, March 19, 1979, pp. 45-47

"Steel: Europe Confronts the Planned Cutbacks," World Business Weekly, July 30, 1979, pp. 10-12

"West Germany Jumps on the Steel-subsidy Bandwagon," World Business Weekly, April 28, 1980, pp. 8-9

"Will the EC Finally Bite the Bullet?" World Business Weekly, October 13, 1980, pp. 11-13

Unpublished documents

These documents relate to joint venture agreements and trade association memoranda and were provided on a confidential basis.

Interviews

Interviews were held with staff members of the Directorate Generals III and IV of the EEC and with employees of several European steel corporations. Names are withheld for reason of confidentiality.

With the exception of Figure 1, the following figures and tables are reproductions of, or compilations from data presented in Investment in the Community Coalmining and Iron and Steel Industries for the years 1975 and 1978.

FIGURE 1

Solid line: oxygen plant

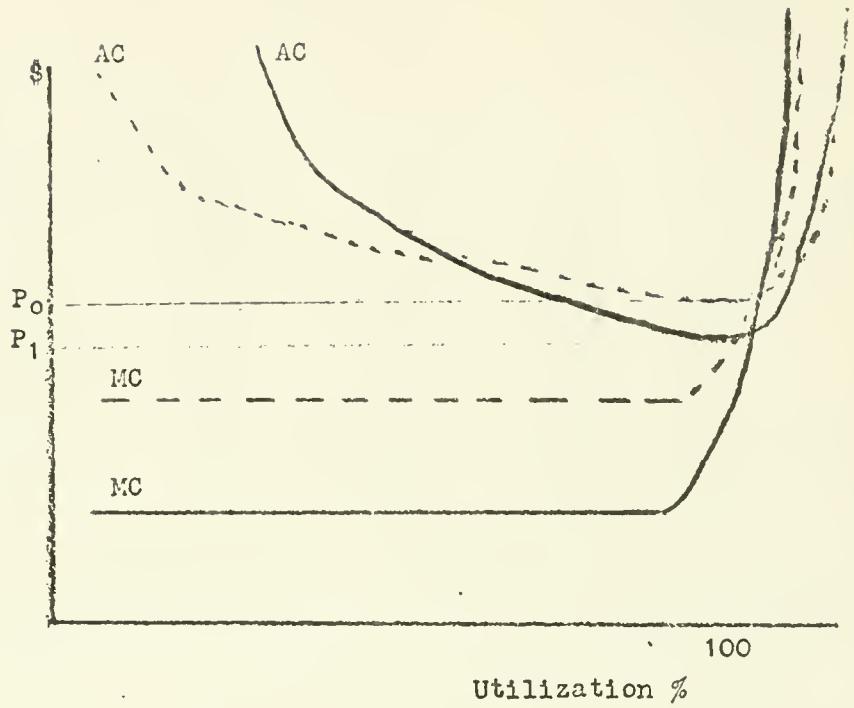
Dotted line: mini-mill

AC: average total cost

MC: marginal cost

P_o: limit price

P_1: price floor



At any $P < P_o$, the mini-mill will produce at a loss, as average total cost per unit exceeds unit price. At any $P < P_1$, the oxygen plant will produce at a loss. P_1 is, thus, the price floor for this industry. At $P > P_o$, and at full utilization, profits are positive for the mini-mill and entry will occur. P_o is, thus, the limit price.

At lower rates of utilization, the cost advantage of the oxygen plant is eroded and even reversed at very low levels. If price is higher than P_o due to oligopolistic behavior and if utilization rates are much higher in the mini-mill, it is possible that the oxygen plant will operate at a loss, while the mini-mill remains profitable. Entry of mini-mills will occur, further eroding the profitability of the oxygen-plant firm, which maintains prices by quantity adjustments.

FIGURE 2

Actual production and production potential of the iron and steel industry

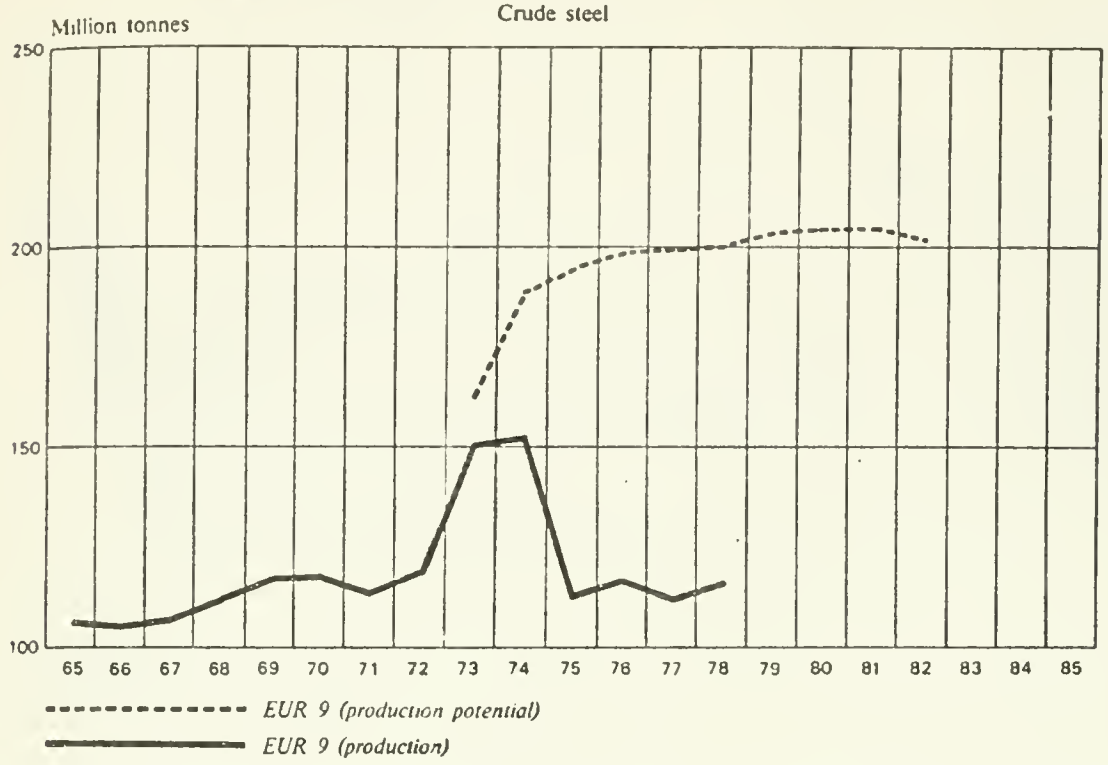


Table I

CRUDE STEEL PRODUCTION IN THOUSAND TONS

	Germany	France	Italy	Netherlands	Belgium	Lux	U.K.
1960	34,100	17,300	8,462	1,950	7,181	4,084	...
1974	53,232	27,020	23,789	5,840	16,225	6,498	22,318
1975	40,415	21,530	21,837	4,826	11,584	4,629	20,105
1976	42,415	23,221	23,447	5,186	12,195	4,566	22,274
1977	38,985	22,089	23,333	4,923	11,256	4,329	20,418
1978[a]	41,200	22,800	24,300	5,600	12,600	4,800	20,300

CRUDE STEEL PRODUCTION POTENTIAL IN THOUSAND TONS

1960	35,335	17,890	8,973	2,078	8,080	4,140	...
1974	60,415	30,525	28,860	6,105	17,795	6,720	27,810
1975	62,859	33,632	32,780	6,339	19,024	7,520	27,080
1976	65,806	33,264	33,656	7,714	18,514	8,220	29,131
1977	67,700	33,300	34,000	8,200	19,200	7,400	28,900
1978[a]	68,900	32,400	35,700	8,300	20,000	7,600	24,900

[a] Rounded to third decimal

ELECTRIC FURNACE STEELWORKS

Investment

Table II

Capital expenditure by regions

Region	Actual expenditure			Actual expenditure		
	1973	1974	1975	1976	1977	1978
Northern Germany	17.18	24.50	12.92	7,4	4,2	0,8
North Rhine/Westphalia	8.41	3.24	10.71	20,6	26,0	31,9
Southern Germany	0.51	3.95	8.22	2,7	2,5	0,2
Saar	—	—	0.90	5,2	1,5	1,1
FR Germany	*26.10*	*31.69*	*32.75*	*35,9*	*34,2*	*34,0*
Belgium	*8.10*	*4.86*	*7.26*	*14,6*	*16,3*	*6,6*
Eastern France	5.61	3.65	3.89	3,2	0,3	0,1
Northern France	3.31	8.43	12.71	9,3	16,6	12,6
France - other areas	26.63	28.38	16.47	8,1	8,0	7,4
France	*35.55*	*40.46*	*33.07*	*20,6*	*24,9*	*20,2*
Italy - coastal areas	4.56	8.87	10.77	13,4	8,2	14,4
Italy - other areas	49.19	69.71	91.54	64,0	48,4	21,9
Italy	*53.75*	*78.58*	*102.31*	*77,4*	*56,6*	*36,3*
Luxembourg	—	—	—	*0,0*	—	—
Netherlands	*0.11*	—	—	—	*0,2*	*0,8*
Scotland	10.65	14.63	4.97	2,7	0,3	0,2
Wales	1.25	1.49	17.89	33,1	15,7	12,5
Northern England	20.71	20.37	24.12	32,6	26,3	14,6
England - other areas	7.99	12.73	9.85	2,1	2,3	1,2
United Kingdom	*40.60*	*49.22*	*56.83*	*70,5*	*44,5*	*28,5*
Denmark	*5.28*	*22.70*	*27.07*	*7,8*	*3,7*	*0,7*
Ireland	—	—	*0.14*	*0,0*	*0,0*	*0,0*
Total EUR 9	169.49	227.51	259.43	226,8	180,4	126,9

ELECTRIC FURNACE STEEL

Production

Table III

Production and production potential by regions

million tonnes

Actual production 1978	Region	Production potential 1973	1974	1975	Production potential 1976	1977	1978
1.1	Northern Germany	0.7	1.2	1.3	1.5	1.4	1.5
3.0	North Rhine/Westphalia	3.6	3.7	3.5	3.8	4.0	4.1
1.3	Southern Germany	1.1	1.1	1.3	1.5	1.5	1.9
0.5	Saar	0.5	0.5	0.5	0.4	0.5	0.5
5.9	*FR Germany*	5.9	6.5	6.6	*7.2*	*7.4*	*8.0*
0.6	*Belgium*	*0.7*	*0.8*	*0.8*	*0.8*	*0.8*	*1.3*
0.5	Eastern France	0.9	1.1	1.3	1.3	0.9	0.7
1.8	Northern France	0.5	0.7	0.7	0.9	2.1	2.3
1.1	France - other areas	1.6	1.8	2.3	2.2	1.5	1.5
3.4	*France*	*3.0*	*3.6*	*4.3*	*4.4*	*4.6*	*4.6*
0.5	Italy - coastal areas	0.3	0.4	0.5	0.9	0.8	0.8
11.8	Italy - other areas	10.3	11.5	12.8	13.5	14.2	16.0
12.3	*Italy*	*10.6*	*11.9*	*13.3*	*14.4*	*15.0*	*16.9*
0.0	*Luxembourg*	*0.1*	*0.1*	*0.1*	*0.1*	*0.0*	*0.0*
0.3	*Netherlands*	*0.4*	*0.4*	*0.4*	*0.4*	*0.3*	*0.4*
0.3	Scotland	0.3	0.3	0.4	0.5	0.5	0.4
1.0	Wales	0.5	0.5	0.5	*0.5*	1.4	2.3
4.4	Northern England	4.1	4.5	4.9	5.3	5.4	5.7
1.4	England - other regions	0.7	0.7	1.2	1.5	1.7	1.7
7.2	*United Kingdom*	5.6	6.0	7.0	*7.8*	*9.1*	*10.2*
0.5	*Denmark*	*0.1*	—	*0.1*	*0.7*	*0.7*	*0.7*
0.1	*Ireland*	—	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*
30.3	Total EUR 9	26.4	29.4	32.7	36.0	38.0	42.0

Table IV

Utilization Rates by Region & Process
in percentage & in production (million tons) for 1978

Region	Basic Bessemer		Open Hearth		Electric Furnace		Oxygen		Total	
	Prod.	%	Prod.	%	Prod.	%	Prod.	%	Prod.	%
Northern Germany	-----	-----	.8	80	1.1	73	6.1	55	8.1	60
North Rhein & Westphalia	-----	-----	3.1	58	3	73	20.0	60	26.1	61
South Germany	-----	-----	.4	80	1.3	68	---	---	2.4	63
Saar	-----	-----	.2	100	.5	100	1.4	28	4.6	51
F.R. of Germany	-----	-----	4.5	.64	5.9	74	27.5	56	41.2	60
Belgium	0.0	-----	---	---	.6	46	10.8	69	12.6	63
Eastern France	1.8	61	.1	100	.5	71	4	77	9.6	74
Northern France	-----	-----	.3	60	1.8	78	6.9	61	9.0	63
Other	-----	-----	0.0	---	1.1	73	3.1	84	4.2	81
France	1.8	61	.5	83	3.4	74	14	69	22.8	70
Italy-Coastal	-----	-----	1.2	52	.5	63	10.3	65	12.0	64
Other	0.0	81.8	.3	60	11.8	74	.2	100	12.3	73
Italy	0.0	81.8	1.5	54	12.3	73	10.5	65	24.3	68
Luxembourg	-----	-----	---	---	0.0		4.3	62	4.8	63
Netherlands	0.0		0.0		.3	75	5.3	67	5.6	67
United Kingdom	0.0	-----	1.8	67	7.2	59	11.3	75	20.3	73

Table V

Movement by stages in production since 1960 [1]

%

Sectors	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
Pig-iron	94,3	90,9	85,5	81,0	88,2	83,8	72,0	79,2	84,8	89,7	85,4	76,6	79,9	84,4	87,5	64,8	66,7	61,5	63,9
Crude steel	95,6	91,7	87,3	83,4	90,0	84,3	78,7	89,0	85,9	88,8	86,1	70,1	81,0	86,0	86,9	65,1	67,8	62,8	65,6
Finished products [2]	89,6	87,2	82,9	78,9	8. ,9	75,9	69,5	68,9	73,2	80,4	78,3	69,3	71,1	78,4	78,6	57,6	60,3	57,5	58,4

[1] Up to and including 1972 Community in its original form only
[2] Except coils finished products

Table VI

By stages of production and countries 1978

Country	Pig-iron	Basic Bessemer and other	OBM, LWS	Open hearth	Electric	LD, Kaldo and other	Crude steel total	Con-tinuous casting	Coils	Heavy sections	Light sections	Wire rod	Hoop and skp	Plate >3 mm	Cold reduced sheet <3 mm	Finished rolled products Total (excl coils finished products)	Pro memoria finished rolled products – Total	
																	1976	1977
FR of Germany	58,1	—	67,5	64,5	74,5	56,0	59,8	72,5	70,5	53,5	47,3	52,0	52,1	44,3	58,9	51,7	54,2	52,4
Belgium	63,6	100	41,2	—	43,2	69,0	63,0	64,2	70,9	78,7	43,0	57,8	26,9	50,8	61,8	56,8	55,4	54,2
France	68,2	59,5	76,6	74,1	75,4	68,7	70,5	82,7	78,9	58,6	67,2	65,0	56,6	51,3	71,9	64,3	64,4	61,0
Italy	66,8	81,8	—	53,5	73,0	65,2	68,0	67,8	58,0	59,4	71,1	68,8	45,5	45,2	65,3	61,6	65,4	65,0
Luxemburg	68,8	—	81,8	—	26,7	62,0	63,4	—	71,0	67,5	50,2	63,0	54,7	61,5	72,0	59,4	53,9	53,1
Netherlands	65,9	—	—	—	75,9	66,8	67,2	—	66,3	100	53,7	43,5	55,5	40,3	63,0	55,6	58,7	55,6
United Kingdom	69,8	36,7	—	65,4	70,8	75,3	72,7	56,7	65,7	58,7	69,4	69,4	63,2	52,7	69,2	64,9	70,9	64,4
Denmark	—	—	—	70,6	75,2	—	73,2	74,0	—	0,0	63,0	—	—	68,3	66,4	66,4	63,9	58,7
Ireland	—	—	—	—	75,6	—	75,6	—	—	70,8	73,1	—	—	—	—	72,4	61,1	31,1
Total EUR 9	63,9	59,3	65,5	63,1	72,1	63,9	65,6	70,3	69,2	59,5	60,4	60,3	53,4	47,5	64,6	58,4	60,6	57,5
EUR 9 - P.M. 1976	66,6	56,1	63,1	68,0	76,6	66,4	67,8	63,8	67,9	60,8	62,2	62,6	59,6	52,2	64,5	60,6		
1977	61,5	36,4	56,9	60,7	71,5	62,4	62,8	65,8	65,8	56,3	59,5	58,1	53,1	48,5	63,6	57,5		

Table VII

Production and production potential by regions

million tonnes

Actual production 1975	Region	Production potential 1973	Production potential 1974	Production potential 1975	Production potential 1976	Production potential 1977	Production potential 1978
2.1	Northern Germany	1.4	2.3	3.3	3,8	3,7	4,1
5.3	North Rhine-Westphalia	6.0	6.2	7.7	10,5	11,8	12,1
1.1	Southern Germany	1.1	1.2	1.3	1,7	1,8	2,1
1.4	Saar	2.0	2.0	2.0	3,2	3,2	3,3
9.9	*FR Germany*	*10.5*	*11.7*	*14.3*	*19,2*	*20,6*	*21,6*
0.5	*Belgium*	—	*0.4*	*0.8*	*1,4*	*3,2*	*4,2*
0.1	Eastern France	0.1	0.1	0.3	0,4	0,4	0,2
2.1	Northern France	2.1	3.4	4.0	4,1	5,2	6,0
0.5	France - other areas	0.2	0.2	0.7	1,4	1,1	1,4
2.7	*France*	*2.4*	*3.7*	*5.0*	*5,9*	*6,7*	*7,6*
1.8	Italy - coastal areas	1.6	1.6	4.0	4,9	4,8	4,8
4.1	Italy - other areas	3.0	3.8	6.0	7,2	8,2	10,5
5.9	*Italy*	*4.6*	*5.4*	*10.0*	*12,1*	*13,1*	*15,3*
—	*Luxembourg*	—	—	—	—	—	—
—	*Netherlands*	—	—	—	—	—	—
0.1	Scotland	—	0.1	0.6	0,6	0,7	0,9
—	Wales	—	—	0.0	0,1	0,9	1,6
1.1	Northern England	—	1.0	1.7	1,7	1,9	2,2
0.6	England - other regions	—	0.6	0.9	0,9	1,1	1,0
1.8	*United Kingdom*	—	*1.7*	*3.2*	*3,3*	*4,7*	*5,6*
0.1	*Denmark*	—	—	*0.1*	*0,7*	*0,6*	*0,7*
—	*Ireland*	—	—	—	—	—	—
21.1	Total EUR 9	17.5	22.9	33.4	42,6	48,8	54,9

Table VIII

Ratio of continuous casting production potential to crude steel production potential in 1978 and 1982

%

Country	1978	1982
FR Germany	31,3	41,4
Belgium	21,0	23,6
France	23,5	38,5
Italy	42,9	50,1
Luxembourg	—	17,3
Netherlands	—	17,4
United Kingdom	20,1	26,9
Denmark	58,3	88,8
Ireland	—	100,0
Community	**27,2**	**37,0**

STEELWORKS
TOTAL

Investment

Table IX

Capital expenditure by regions

million u.a.

Region	Actual expenditure			Actual expenditure		
	1973	1974	1975	1976	1977	1978
Northern Germany	24.31	31.00	23.87	37,0	18,0	4,8
North Rhine/Westphalia	33.09	43.24	68.36	100,2	63,0	56,8
Southern Germany	0.90	8.87	18.06	8 9	7,7	1,7
Saar	5.86	11.18	20.62	24,9	11,2	17,6
FR Germany	64.16	94.29	130.91	*171,0*	*100,0*	*80,9*
Belgium	36.49	61.99	42.14	*59,0*	*29,5*	*11,7*
Eastern France	13.63	10.45	14.75	28,9	69,6	93,8
Northern France	22.30	14.30	18.39	28,8	33,3	18,3
France - other areas	70.00	73.55	43.39	13,1	10,6	8,9
France	*105.93*	*98.30*	*76.53*	*70,8*	*113,5*	*121,0*
Italy - coastal areas	76.81	40.96	24.27	39,0	54,5	54,1
Italy - other areas	49.45	71.83	94.93	65,0	48,6	22,0
Italy	*126.26*	*112.79*	*119.20*	*104,0*	*103,1*	*76,0*
Luxembourg	*12.93*	*4.28*	*17.87*	*31,8*	*20,2*	*14,2*
Netherlands	*15.51*	*24.60*	*40.07*	*16,7*	*8,2*	*6,7*
Scotland	16.57	19.87	27.16	15,1	11,3	12,4
Wales	20.34	14.93	28.78	36,3	17,8	16,0
Northern England	29.47	21.85	33.97	67,2	53,9	30,5
England - other areas	8.57	13.37	10.46	2,2	2,5	1,3
United Kingdom	*74.95*	*70.02*	*100.37*	*120,8*	*85,6*	*60,2*
Denmark	*5.28*	*22.87*	*27.11*	*7,9*	*3,9*	*0,8*
Ireland	—	—	*0.14*	*0,0*	*0,0*	*0,0*
Total EUR 9	441.51	489.14	554.34	582,0	463,9	371,6

Table X

Value of investment projects in the steel industry notified to the Commission between 1970 and 1978 in accordance with Article 54 of ECSC Treaty

million EUA at current prices

	Germany (FR)	Belgium	France	Italy	Luxembourg	Netherlands	United Kingdom	Community
1970	411	152	1 965	1 307	35	177	*	*
1971	274	25	201	132	29	8	*	*
1972	448	109	61	186	2	—	*	*
1973	122	221	76	216	20	38	*	*
1974	482	247	287	771	24	129	345	2 284
1975	416	301	389	314	9	—	750	2 179
1976	571	7	267	85	28	—	491	1 448
1977	284	—	278	261	113	89	309	1 380
1978	259	35	62	39	62	—	165	622

* Not available